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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,035	02/20/2004	Junkyung Kim	06181/0200909-US0	1634
7278	7590	03/27/2007		
DARBY & DARBY P.C. P. O. BOX 5257 NEW YORK, NY 10150-5257			EXAMINER RONESI, VICKEY M	
			ART UNIT	PAPER NUMBER
			1714	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/27/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/784,035

Applicant(s)

KIM ET AL.

Examiner

Vickey Ronesi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. All outstanding rejections have been withdrawn in light of applicant's amendment filed on 1/23/2007.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
3. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on 1/23/2007. In particular, claims have been amended to have a cyclic ester oligomer to clay ratio of 100:0.1-3 by weight. Additionally, the method claims now include a step of polymerizing by reaction injection molding or reactive extrusion. Thus, the following action is properly made final.

### *Claim Rejections - 35 USC § 103*

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takekoshi '052 (US 5,530,052).

With respect to claims 1-4, Takekoshi '052 discloses compositions which are nanocomposites (col. 2, line 30) comprising a layered clay (col. 2, lines 37-67) and macrocyclic oligomers including poly(ethylene terephthalate), poly(butylenes terephthalate), poly(ethylene-2,6'-naphthalenedicarboxylate) (col. 5, lines 11-22), wherein the oligomer is polymerized with no more than 20 wt % layered clay (col. 5, lines 48-62). In the examples, 0.20 g sodium montmorillonite is used and mixed with 4.8 macrocyclic oligomer based on poly(ethylene terephthalate) and polymerized at 190°C (col. 6, lines 1-58). See other examples in Tables I and II.

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While Takekoshi '052 does not exemplify a ratio of cyclic ester oligomer to clay of 100:0.1-3, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, given that Takekoshi '052 discloses that up to 20 wt % layered clay is polymerized with the cyclic ester oligomer, it would have been obvious to one of ordinary skill in the art to use any amount up to 20 wt %, including those presently claimed, in order to have impart a desired level of properties from the layered clay.

With respect to claims 5-10 and 12-15, even though Takekoshi '052 fails to explicitly disclose a separation of clay layers of at least 50 nm, nevertheless, it is considered that it would have been obvious to one of ordinary skill in the art to obtain a nanocomposite with at least 50 nm spacing of clay given that Takekoshi '052 discloses nanocomposites and a method of polymerization of cyclic oligomers like presently claimed

5. Claim 9-10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takekoshi '052 (US 5,530,052) in view of Takekoshi '626 (US 6,960,626).

The discussion with respect to Takekoshi '052 in paragraph 4 above is incorporated here by reference.

With respect to claims 9, 10, and 13-15, Takekoshi '052 fails to disclose polymerization carried out by reaction molding process such as reaction injection molding or reactive extrusion

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but appears to be open to any method of mixing the layered clay with the cyclic oligomer (col. 5, lines 47-62).

Takekoshi '626 discloses a macrocyclic oligomer polymerized with a magnesium silicate and teaches that the cyclic oligomer is mixed with the layered silicate is well-suitable to low-pressure processes including reaction injection molding (col. 13, lines 6-12).

Given that Takekoshi '052 is open to various ways of combining the cyclic oligomer and layered clay and further given the teachings by Takekoshi '626 regarding such compositions and their suitability for reaction injection molding, it would have been obvious to one of ordinary skill in the art to polymerize the cyclic oligomer and layered clay of Takekoshi '052 in reaction injecting molding.

With respect to claim 11, Takekoshi '052 fails to explicitly disclose the length of polymerization, however, it is considered that it would have been well within the capabilities of one of ordinary skill in the art to utilize suitable polymerization times in order to obtain full polymerization. Furthermore, given that Takekoshi '052 discloses the same cyclic oligomer to be polymerized under the same conditions like presently claimed (i.e., temperature), the length of time is dependent on this parameter and would therefore be a length of 5-10 minutes.

#### ***Response to Arguments***

6. Applicant's arguments filed 1/23/2007 have been fully considered but they are not persuasive. Specifically, applicant argues (A) that an unexpected result is had when using the cyclic ester oligomer in a ratio to clay of 100:0.1-3 by weight and (B) that US 6,960,626 is not

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prior art because reactive injection molding is not supported by the applications in the continuity chain.

With respect to argument (A), the examples in the specification as originally filed cannot serve to establish unexpected results because there is no evidence that a ratio of 100:1 is any better than a ratio of 100:5.

With respect to argument (B), applicant's attention is drawn to the Provisional application No. 60/177,727 filed on 1/21/2000 which states on page 3 that structural reaction injection molding is used to prepared the thermoplastic composites.

### *Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Ronesi whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3/20/2007  
Vickey Ronesi

*WR*

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